

What is claimed is:

1. An ink-jet recording apparatus comprising:  
a flashing signal generating unit that generates a flashing signal; and

a recording head provided with a nozzle and capable of jetting ink particles through the nozzle on the basis of the flashing signal;

wherein the flashing signal causes the recording head to jet ink particles through the nozzle so that each of the ink particles is a main ink particle.

2. An ink-jet recording apparatus according to claim 1, wherein the flashing signal is a periodic signal.

3. An ink-jet recording apparatus according to claim 2, wherein the periodic signal has periodic pulses, and each of the pulses has a trapezoidal waveform having a first inclined section, a potential maintaining section continuous with the first inclined section and a second inclined section continuous with the potential maintaining section.

4. An ink-jet recording apparatus according to claim 3, wherein the first inclined section is inclined gently and the second inclined section is inclined sharply.

5. An ink-jet recording apparatus according to claim 1, wherein each of the ink particles jetted through the nozzle flies at a speed of 5 m/s or above.

6. An ink-jet recording apparatus comprising:  
a flashing signal generating unit that generates a flashing signal; and

a recording head provided with a nozzle and capable of jetting ink particles through the nozzle on the basis of the flashing signal;

wherein the flashing signal causes the recording head to jet ink particles through the nozzle so that each of the ink

particles has a momentum greater than a predetermined value.

7. An ink-jet recording apparatus according to claim 6, wherein the flashing signal is a periodic signal.

8. An ink-jet recording apparatus according to claim 7, wherein the periodic signal has periodic pulses, and each of the pulses has a trapezoidal waveform having a first inclined section, a potential maintaining section continuous with the first inclined section and a second inclined section continuous with the potential maintaining section.

9. An ink-jet recording apparatus according to claim 8, wherein a duration of each of the pulses is 25  $\mu$ s, a gradient of the first inclined section is 10 V/ $\mu$ s, a level of the potential maintaining section is 20 V, and a gradient of the second inclined section is 9.6 V/ $\mu$ s.

10. An ink-jet recording apparatus according to claim 6, wherein each of the ink particles jetted through the nozzle has a weight of 10 ng or above and flies at a speed of 4 m/s or above.

11. An ink-jet recording apparatus comprising:  
a flashing signal generating unit that generates a flashing signal; and

a recording head provided with a nozzle and capable of jetting ink particles through the nozzle on the basis of the flashing signal;

wherein the flashing signal causes the recording head to intermittently jet the ink particles through the nozzle so that the ink particles include sets of a main ink particle and minute ink particles after the main ink particle, and the minute particles of the set combine with a main ink particle of a following set in a range of a predetermined distance from the nozzle.

12. An ink-jet recording apparatus according to claim 11, wherein the flashing signal is a periodic signal.

13. An ink-jet recording apparatus according to claim 12, wherein the periodic signal has periodic pulses, and each of the pulses has a trapezoidal waveform having a first inclined section, a potential maintaining section continuous with the first inclined section and a second inclined section continuous with the potential maintaining section.

14. An ink-jet recording apparatus according to claim 12, wherein the flashing signal has a frequency of 10 kHz or above.

15. An ink-jet recording apparatus according to claim 11, wherein each of the ink particles jetted through the nozzle flies at a speed of 8 m/s or above.

16. An ink-jet recording apparatus according to claim 11, wherein the predetermined distance from the nozzle is 2 mm.

17. An ink-jet recording apparatus according to claim 1 further comprising a capping means capable of sealing the nozzle of the recording head, and wherein the ink particles jetted by the recording head through the nozzle on the basis of the flashing signal are caught by the capping means.

18. An ink-jet recording apparatus according to claim 1 further comprising:

a member provided with an opening opposite to which the nozzles of the recording head can be disposed; and

an ink absorbing member disposed on the side of a bottom part of the opening;

wherein the ink particles jetted by the recording head through the nozzle on the basis of the flashing signal fly through the opening and are caught by the ink absorbing member.

19. The ink-jet recording apparatus according to claim

1, wherein the recording head is provided with a plurality of nozzles respectively for different inks, and different flashing signals are used for the nozzles for jetting the different inks, respectively.

20. The ink-jet recording apparatus according to claim 1, wherein the recording head is provided with a plurality of nozzles respectively for different inks, a plurality of flashing regions are formed, and ink particles of the different inks jetted by the recording head through the plurality of nozzles are caught in the different flashing regions, respectively.

21. The ink-jet recording apparatus according to claim 1 further comprising:

a fan for preventing a temperature rise of the recording apparatus; and

a fan control means for stopping the fan during a flashing operation in which the recording head jets ink particles through the nozzle.

22. The ink-jet recording apparatus according to claim 21, wherein the fan control means keeps the fan stopped at least until the ink particles jetted by the recording head through the nozzle on the basis of the flashing signal arrive at and are caught by the ink absorbing member.

23. The ink-jet recording apparatus according to claim 1, wherein the flashing signal is generated separately from a printing signal on the basis of printing data.

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